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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/127,644 07/31/98 SCHOB

R 15258-337

EXAMINER

MMC2/0409

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ART UNIT

PAPER NUMBER

2834
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Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.

09/127,644

Applicant(s)

SCHOB, RETO

Examiner

Tamai IE Karl

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).

Status

- 1) ☒ Responsive to communication(s) filed on 12 January 2001.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☐ Claim(s) 1,3-8 and 10-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) 1,3-8,10,14 and 17-21 is/are rejected.
- 7) ☐ Claim(s) 11-13, 15, 16, and 22 is/are objected to.
- 8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- a) ☒ All b) ☐ Some * c) ☐ None of the CERTIFIED copies of the priority documents have been:
1. ☒ received.
2. ☐ received in Application No. (Series Code / Serial Number) _____.
3. ☐ received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. & 119(e).

Attachment(s)

- 14) ☐ Notice of References Cited (PTO-892)
- 15) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 16) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 17) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 18) ☐ Notice of Informal Patent Application (PTO-152)
- 19) ☐ Other: _____

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DETAILED ACTION

Drawings

1. The objection to the drawings under 37 CFR 1.83(a) is withdrawn

Claim Rejections - 35 USC § 112

2. The rejection of Claims 3-7 under 35 U.S.C. 112 is withdrawn.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1, 4, 8, 9, 10, and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nichols and Lyman. Nichols teaches a magnetically levitated ring shaped rotor which the stator having axially aligned levitating magnets and circumferentially disposed field windings 40 to rotate the rotor. Nichols teaches unipolar rotor flux in the ferromagnetic, reluctance poles of the rotor which close the magnetic circuit with the stator bearing magnets 38. Nichols teaches control windings 42 on the stator to control the unipolar magnetic bearing flux. Nichols teaches every aspect of the invention, except permanent magnets on the rotor creating unipolar magnetic

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bearing flux and an additional stator(or two) in a plane parallel with bearing plane.

Lyman teaches an axially oriented permanent magnet 31 on the rotor to provide magnetic bearing flux across the air gap with the stator. Lyman teaches the rotor can be either disk shaped inside the ring shaped stator or the rotor can be ring shaped outside the stator. Lyman teaches a plurality of stators in parallel to provide magnetic bearing support to the rotor. Lyman does not teach a plurality of magnets on the arranged on the disk shaped rotor. Nichols teaches the permanent magnet producing the bearing flux being four circumferentially, spatially modulated magnets 38a rather than a single permanent magnet. It would have been obvious to a person skilled in the art at the time of the invention to construct the motor of Nichols with the permanent magnet on the rotor as in Lyman to efficiently support a rotor with a large moment of inertia, and with a first and second stator in parallel with the bearing plane because Lyman teaches a plurality of bearing disks provide additional support to rotor.

5. Claims 1, 3, 4, 5, 8, 10, and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shimamoto and Scheller(US 4,668,885). Shimamoto teaches annular rings on the rotor and stator with a unipolar flux journal, where the stator includes a means to produce a field 30 for the rotation of the rotor. Shimamoto teaches control windings 82, 84, 86, 88 to control the magnet journal flux. Shimamoto teaches an axially magnetized permanent magnets 62/64 on the stator having control windings 88 and axially magnetized permanent magnets 70/72 on the rotor, where the permanent

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magnets 62/64 and 70/72 are positioned on opposite sides of a rotor ring 56 and stator disk 48. Shimamoto teaches rings 66 and 68 which are parallel to the bearing plane at 46. Shimamoto teaches a disc shaped motor stator 16 which is parallel to the bearing plane. Shimamoto does not teach the magnets being spatially modulated. Scheller teaches a plurality of spatially modulated magnets 10 are equivalent to an annular ring magnet. It would have been obvious to a person skilled in the art at the time of the invention to construct the motor of Shimamoto with spatially modulated magnets because Scheller teaches a plurality of spatially modulated magnets are simple and easy to manufacture.

6. Claims 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shimamoto and Scheller, in further view of Machino. Shimamoto and Scheller teach every aspect of the invention, except the permanent magnets on the rotor and stator being both radially aligned and alternately aligned(one axially/one radially magnetized). Machino teaches the equivalence of permanent magnets being both axially aligned(figure 1a), both radially aligned (figure 1b) and alternately aligned(figure 3 showing the stator magnet being radially magnetized with the rotor magnet being axially aligned). It would have been obvious to a person skilled in the art at the time of the invention to construct the motor of Shimamoto and Scheller with the bearing magnets on the rotor and stator being both radially aligned or alternately aligned because Machino teaches the equivalence of the magnetization of the bearings being axially,

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radially or alternatively magnetized, and it would have an obvious selection of equivalents to choose between different magnetization for the bearing.

7. Claims 17-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nichols and Lyman, in further view of German Patent 945,183('183). Nichols and Lyman teach every aspect of the invention except, a rotatable drive which can be magnetically coupled to the rotor. '183 teaches a magnetic couple drive with a radial magnetic couple 20 and an axial magnetic couple 11 which are equivalent to a motor driven 28 rotor. It would have been obvious to a person skilled in the art at the time of the invention to construct the motor of Nichols and Lyman with the magnetic couple drive because '183 teaches the equivalence of a magnetic couple drive and a motor drive, such that it would have been an obvious design choice to select between known equivalents, and because a mechanical drive allows the drive source to be positioned away from the rotor.

8. Claims 20 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nichols and Lyman, in further view of Schoeb. Nichols and Lyman teach every aspect of the invention, except the use of the motor in biological liquids and in a bio-reactor. Schoeb teaches the use of motors in biological liquids and in a bio-reactor. It would have been obvious to a person skilled in the art at the time of the invention to

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construct the motor of Nichols and Lyman for use in biological liquids to allow the motors to operate as blood pumps, as in Schoeb.

9. Claims 17-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shimamoto and Scheller, in further view of German Patent 945,183('183). Shimamoto and Scheller teach every aspect of the invention except, a rotatable drive which can be magnetically coupled to the rotor. '183 teaches a magnetic couple drive with a radial magnetic couple 20 and an axial magnetic couple 11 which are equivalent to a motor driven 28 rotor. It would have been obvious to a person skilled in the art at the time of the invention to construct the motor of Shimamoto and Scheller with the magnetic couple drive because '183 teaches the equivalence of a magnetic couple drive and a motor drive, such that it would have been an obvious design choice to select between known equivalents, and because a mechanical drive allows the drive source to be positioned away from the rotor.

10. Claims 20 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shimamoto and Scheller, in further view of Schoeb. Shimamoto and Scheller teach every aspect of the invention, except the use of the motor in biological liquids and in a bio-reactor. Schoeb teaches the use of motors in biological liquids and in a bio-reactor. It would have been obvious to a person skilled in the art at the time of the

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invention to construct the motor of Shimamoto and Scheller, for use in biological liquids to allow the motors to operate as blood pumps, as in Schoeb.

Allowable Subject Matter

11. Claims 11-13, 15, 16, and 22 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

12. Applicant's arguments filed January 12, 2001 have been fully considered but they are not persuasive. The Applicant's argument regarding the combined teaches of Nichols and Lyman is not persuasive. Nichols teaches the unipolar rotor journaled to the stator. Lyman merely teaches that including a permanent magnet on the rotor. It is obvious to person skilled in the art, that the inclusion of the magnet on the rotor increases the journal flux between the stator and the levitated rotor. The Applicant's argument regarding inhomogeneous flux on the rotor is not persuasive. Nichols clearly teaches the inhomogeneous flux on the rotor. The fact that Lyman teaches a homogeneous flux does not prevent Lyman from suggesting that the magnet would be included on the rotor for other purposes, such as a convenient place generate the bearing flux or to increase the bearing flux by having magnets on the rotor and the stator. The Applicant cannot attach the references individually when the rejection is

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made on the combined teachings of the references(*In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986)). The Applicant's argument regarding Lyman and Nichols different teachings of homogeneous magnetic flux as being a rational not to combine the references is not persuasive. Both references teach magnetic bearings, and Lyman is only included to show the source of the magnetic flux in the rotor, not the flux flow through the air gap.

The Applicant is argument regarding the combination of Lyman and Nichols is completely not persuasive. The magnetic flux of Nichols travels axially through the rotor and is spacially modulated by the groves in the outer circumference. The combination of Lyman and Nichols provides the permanent magnet of Lyman with the rotor of Nichols to generate a stronger magnetic flux through the rotor because the flux is not generated on the stator. The Applicant's argument that the axial magnet of Lyman cannot create a spacial modulation is not persuasive because the claim limitations do not require the permanent magnet to directly cause the spacial modulation on the rotor. Therefore the magnetic flux from the axial permanent magnet of lyman would create a spacial modulation at the air gap due to the grooves in the air gap of Nichols rotor. The rejection is proper and maintained.

The Applicant's argument regarding the teachings of Scheller is not persuasive. Scheller teaches a ring magnet constructed from either a plurality of magnets with are closely spaced (ring) or spaced out(spacially modulate), see col. 3, line29-30 and figure 2. The magnetic flux is inherently spatially modulated between the magnets. The

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Applicant's argument the iron ring 11 provides a homogeneous flux is not persuasive. The flux in the ring between the magnets will inherently be weaker than directly in front of the magnet because of flux leakage. The rejection is proper and maintained.

Conclusion

13. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karl I.E. Tamai whose telephone number is (703) 305-7066.

The examiner can be normally contacted on Monday through Friday from 8:00 am to 4:00 pm. If attempts to reach the examiner by telephone are unsuccessful, the

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examiner's supervisor, Mr. Nestor Ramirez, can be reached at (703)308-1371. The facsimile number for the Group is (703)305-3432.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0956.



KARL TAMAI
PRIMARY EXAMINER

Karl I Tamai
PRIMARY PATENT EXAMINER
April 5, 2001